

What is claimed is:

1. A method for actively characterizing the latency of an audio channel of a computer, comprising:

creating at least two signal streams for a waveform in said audio channel;

detecting the presence of the first signal sample stream for said waveform and the second signal sample stream for said waveform at a point in said audio channel; and

measuring the time between the detections of the signal sample streams.

2. The method of claim 1, wherein said audio channel includes an audio signal output device and an audio signal input device;

creating a waveform in said audio channel comprising creating a waveform in said audio channel before said audio signal output device, said waveform having a signature to activate said audio signal output device to produce an audio output signal; and

detecting the presence of a first signal sample stream for said waveform and a second signal sample stream for said waveform at a point in said audio channel comprising detecting the signal sample streams in said audio channel at a point after said audio signal input device, wherein the first signal sample stream was propagated along a reference channel path in said computer and the second signal stream was produced from said audio output signal and propagated along a local channel path in said computer.

3. The method of claim 2, wherein the audio signal output device includes at least one speaker.

4. The method of claim 2, wherein the audio signal input device includes a microphone.

5. The method of claim 2, wherein said waveform comprises a chirp waveform.

6. The method of claim 2, wherein said waveform comprises a pseudo-random sequence waveform.

7. The method of claim 2, wherein said waveform comprises a sine waveform.

8. The method of claim 2, wherein measuring the time between the detections comprises counting the number of signal samples between the detections.

9. The method of claim 1, wherein after creation, the two signal streams propagate along two different paths in said computer.

10. The method of claim 1, wherein said computer comprises a personal computer.

11. The method of claim 1, and further comprising: delaying at least one of the signal sample streams based, at least in part, on the time measured between the detections.

12. A method for actively characterizing the latency of an audio channel of a computer comprising:

3 creating at least a first and a second waveform in said audio channel;
4 detecting the presence of the first and second waveform at a point in said audio
5 channel; and
6 measuring the time between the detections of the waveforms.

1 13. The method of claim 12, wherein at least one of said waveforms comprises a chirp
2 waveform.

1 14. The method of claim 12, wherein at least one of said waveforms comprises a pseudo-
2 random sequence waveform.

1 15. The method of claim 12, wherein at least one of said waveforms comprises a pseudo-
2 random sequence waveform.

1 16. The method of claim 12, wherein after creation, the two waveforms propagate along two
2 different paths in said computer.

1 17. The method of claim 12, wherein said computer comprises a personal computer.

1 18. The method of claim 12, and further comprising: delaying at least one of the waveforms,
2 based at least in part, on the time measured between the detections.

1 19. An article comprising:

2 a machine-readable storage medium, said storage medium having stored thereon
3 instructions, said instructions, when executed by a computer system including an audio channel,
4 resulting in the following steps:

5 creating at least two signal streams for a waveform in said audio channel;
6 detecting the presence of the first and the second signal sample stream for said
7 waveform at a point in said audio channel; and
8 measuring the time between the detections of the signal sample streams.

1 20. The article of claim 19, wherein the waveform comprises a chirp waveform.

1 21. The article of claim 19, wherein the computer system including an audio channel comprises
2 a personal computer system including an audio channel.

1 22. An article comprising;

2 a machine-readable storage medium, said storage medium having stored thereon
3 instructions, said instructions, when executed by a computer system including an audio channel,
4 resulting in the following steps:

5 creating at least two signal waveforms in said audio channel;
6 detecting the presence of the first and the second waveforms at a point in said
7 audio channel; and
8 measuring the time between the detections of the waveforms.

1 23. The article of claim 22, wherein at lease one of the waveforms comprises a chirp
2 waveform.

1 24. The article of claim 22, wherein the computer system including an audio channel comprises
2 a personal computer system including an audio channel.

Table 1. Demographic characteristics of the study population	
Age (years)	65.0 ± 10.0
Gender	
Male	50 (50.0%)
Female	50 (50.0%)
Education (years)	12.0 ± 2.0
Marital status	
Married	40 (80.0%)
Single	10 (20.0%)
Occupation	
Retired	30 (60.0%)
Unemployed	20 (40.0%)
Income (USD/month)	1,200 ± 300
Health status	
Good	30 (60.0%)
Poor	20 (40.0%)
Comorbidities	
Hypertension	15 (30.0%)
Diabetes	10 (20.0%)
Cholesterol	12 (24.0%)
Smoking status	
Smoker	10 (20.0%)
Non-smoker	40 (80.0%)
Alcohol consumption	
Regular	5 (10.0%)
Occasional	15 (30.0%)
Never	30 (60.0%)